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[001]

# CONTROL OF AN AUTOMATIC OR AUTOMATED GEARBOX USING VOICE COMMAND

[002]

[003]

According to the preamble of Claim 1 the invention relates to the control of an automatic or automated gear shift in a variable transmission of a vehicle.

[004]

[005]

Automatic or automated transmission of vehicles usually engage in accordance with preset shift programs which allow different parameters of the existing state of the vehicle and driver's requests to enter into the calculation of a suitable reduction ratio of the transmission. The sensors that produce the different parameters cannot detect imminent driving situations and influences upon the vehicle originating from the traffic situation and thus also cannot be the basis of a calculation. In different situations the active engagement of the driver is required since he can better appraise the vehicle situation, the traffic situation, the road state, or the peculiarities of the topography.

[006]

Situations can thus occur in which the transmission does shift but that are unsuitable and disagreeable for the driver. In those cases the transmission can shift at a moment unforeseeable for the driver or also an unforeseeably higher gear change not suited to the existing traffic situation or topography can be carried out.

[007]

DE 196 50 770 A1 has disclosed by way of example for automatic transmissions to control and thus to adjust the control lever for different shifting modes of the transmission via a voice control. Here the normally manual introduction of a shifting mode in an automatic transmission is replaced by the voice command, that is, the introduced shifting mode of an automatic transmission, not the change of a reduction ratio within the transmission, is corrected by voice control. Which reduction ratio is shifted to the respective shifting mode remains as before left to the control of the automatic transmission. Such an adjustment of the desired shifting mode also takes place only in few situations of the vehicle operation since, the same as is usual in an automatic transmission, the different shifting modes as a rule are introduced when the vehicle is stopped (forward, reverse, parking, etc.) and then during the driving operation in the respective

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[010]  
[011]

In a system for shifting an automatic or automated variable transmission of a vehicle <sup>with</sup> ~~with~~ a device for voice command by the driver in which the voice commands given by the driver are compared with reference voice commands stored in a memory and therefrom control signals are formed, in a transmission control of the vehicle the control signals formed from the driver's voice commands are superimposed onto the shifting signals calculated by the transmission control in order to form therefrom a shift command for the vehicle transmission that is suited to a situation. Thereby the driver can control the vehicle correctly on the basis of vehicle, traffic situation or also topography. In an advantageous development the number of ratio steps when changing the reduction ratio, both when upshifting and when downshifting, are to be given via the device for voice command <sup>and in</sup> ~~and in~~ another development special driving programs like economy or sports programs or winter programs are to be given. In one development the creeping of the vehicle is to be suppressed by the device for voice command. In an advantageous development the command to maintain the actually engaged reduction ratio is given by the device for voice command or in one development a desired starting ratio corresponding to the actual load or gradient on which the vehicle stands is to be given. Another development shows for the device for voice command an apparatus of easy access for the driver with which the use of the

device for voice command is released. In one development the use of a predeterminable time interval is released and in one development the apparatus is designed exclusively accessible for the driver himself during the travel.

[012] An imminent traffic situation like a traffic light signal installation blocking a thoroughfare, the end of a bottleneck, a level crossing or a pedestrian crossing are detected by the driver with his sense organs. The same applied to the detection of an imminent gradient after a long drive on lat road or reaching of the bottom of the valley after long uphill-drive possibly using additional braking devices of the vehicle. The given road state, specially as consequence of weather influences, hardly plays an important part for the reduction ratio to be engaged. The imminent situation can likewise require a shift over several gear steps or conversely not allow it or make it seem unsuitable. The driver can decide whether a gear shift still is or is not adequate. Accordingly, he will allow it, correct ir or prevent it by entering voice commands.

[013] The shift reduction steps can be relevant to safety depending on the vehicle situation. Gear sifts based on wrong interpretation of the voice detection system, for ex., due to conversations of the passengers or other environmental noises like street noises or radio noises mus therefore be reliably eliminated. It must be possible to prevent that passenger emits an inappropriate voice command which becomes a dangerous engagement in the vehicle control. Hence, a control element must be provided that only the driver can reach and that releases only at times the input of voice commands to the transmission control. This can be an inching switch which when actuated releases the command input for the transmission functions for a predetermined or programmed time interval.

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[014]

[015] The invention is explained in detail with reference to a drawing.

[016]

[017] The single figure shows an automated transmission 2 which is connected via a control line 4 such as a CAN bus line or other communication bus line with a transmission control 6, a clutch regulator 8 and a gear shift lever 10. Via the line 16 compressed air is supplied to a transmission regulator 14 and via the line 12 compressed air is supplied to the clutch regulator 8. The control line 4 is connected on an interface 18 with other elements of the vehicle not shown here like, for ex., motor electronics (EDC), motor brake, ABS, ASR or retarders. A device for voice command 20 is likewise attached to the control line 4. In the device 20 a memory 22 is located for voice commands reference. A microphone 24 for input of voice commands by the driver is connected with the device 20. On the gear shift lever 10 a button 26 is provided with which the driver can release the voice commands. Such button can also be provided as steering drop arm on a steering wheel not shown here. The button can also be situated directly on the surface of the steering wheel or in the engagement area on the steering wheel rim.

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Reference numerals

2 transmission	16 line
4 control line	18 interface
6 transmission control	20 device for voice command
8 clutch regulator	22 memory
10 gear shift lever	23 microphone
12 line	24 button
14 transmission regulator	

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